

REMARKS/ARGUMENT

A. Introduction

The present application is the national stage of international application No. PCT/IT2003/000379 filed on June 19, 2003, which claims priority to Italian application No. PD2002A000309 filed on December 4, 2004.

While the international application was filed in the English language, certain terminology in the specification and in the claims does not conform to proper American English. Additionally, the structure of the claims does not conform to the applicable U.S. rules.

Therefore, corrections to the specification and claims have been introduced by means of this preliminary amendment, which is being submitted pursuant to 37 CFR 1.115.

B. In the Specification

A substitute specification is submitted together with this preliminary amendment pursuant to 37 CFR 1.125 and MPEP 608.01(q). In particular:

1. No new matter has been added pursuant to 37 CFR 1.125(b);
2. A marked up version and a clean version of the substitute specification are enclosed pursuant to 37 CFR 1.125(c).

Regarding the changes to the original specification:

- a. Paragraph numbering has been added;
- b. Section titles have been added pursuant to MPEP 608.01(a);
- c. Proper American English language has been introduced throughout;
- d. Certain wording has been altered in order to maintain consistency of terms between written description and claims;

- e. The title has been changed to read as the title of the above referenced published application PCT/IT2003/000379.

C. In the Claims

Claims 1, 4, 7-8 remain in this application. Claims 2-3, 5-6, and 9-12 have been canceled. Claims 13-21 have been added. Therefore, upon entry of this preliminary amendment, claims 1, 4, 7-8, and 13-21 will be subject to examination.

As in the specification, proper American English and proper formatting have been introduced. Further, the new claims relate to subject matter previously claimed in canceled claims 2-3, 5-6, 9-12, which did not comply with U.S. claim dependency requirements. Therefore, the new claims have been introduced to provide appropriate claim dependencies.

In particular, claim 1 has been modified to emphasize the single-block construction of the blasting booth, which was previously claimed in canceled claim 3.

New claim 13 is directed at the use of sodium bicarbonate or mixtures thereof, previously claimed in claim 1.

New claim 14 is directed at the subject matter of canceled claim 5.

New claim 15 is directed at the subject matter of canceled claim 2.

New claim 16 is directed at the subject matter of canceled claim 6.

New claim 17 is directed at the subject matter of canceled claim 9.

New claim 18 is directed at the subject matter of canceled claim 10.

New claim 19 is also directed at the subject matter of canceled claim 10.

New claim 20 is directed at the subject matter of canceled claim 11.

New claim 21 is partly directed at the subject matter of canceled claim 12, and partly at the subject matter of lines 3-6 at page 8 of the original specification..

No new matter has been added.

CONCLUSION

In view of the amendments and remarks submitted herein, Applicant respectfully requests that a timely Notice of Allowance be issued in this case.

If it is felt for any reason that direct communication would serve to advance prosecution of the present application in this case, the Examiner is invited to contact the undersigned attorney of record, Franco A. Serafini, by telephone, fax, or e-mail.

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Respectfully submitted,

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MARKED-UP COPY OF THE SPECIFICATION

TITLE OF THE INVENTION

[0001] ~~INDUSTRIAL CLEANING PLANT WITH SINGLE BLOCK PLASTIC BOOTH AND INTEGRATED FEEDING AND FILTERING DEVICES~~Abrasive cleaning plant with single block plastic booth and integrated feeding and filtering device

DESCRIPTION BACKGROUND OF THE INVENTION

TECHNICAL FIELD 1. Field of the invention

[0002] ~~This patent~~ The present invention concerns equipment for industrial cleaning with sodium bicarbonate or similar means. In particular this patent refers to sandblasting booths and plants for the industrial cleaning of medium-small size elements, an abrasive cleaning plant by a blasting process, and, more particularly, a plant suitable for the abrasive cleaning of small and medium size object.

STATE OF THE ART 2. Description of related art

[0003] ~~At present to remove paint from~~ In the prior art, the cleaning of metal and non-metal objects, ~~and to clean~~ especially objects with rigid surfaces on which ~~solid dirt that is difficult to remove and/or resistant polluting dirt deposits~~ such as grease, oil and ~~other~~ is paint are deposited, ~~cleaning~~ is performed by means of sandblasting, which consists ~~in of~~ projecting towards the ~~object~~ objects, by means of ~~pressurised~~ pressurized air, ~~grains~~ granules of sand or of other solid material, in order to remove by abrasion all the substances that have adhered to the object to be cleaned.

[0004] Basically, a flow of ~~pressurised~~ pressurized air, conveyed in a Venturi tube, sucks the sand or, in general, the granular abrasive material ~~in granules~~ from a tank and conveys it to a delivery nozzle from which it is discharged at high speed.

[0005] Alternatively, a pressure tank ~~is~~ may be adopted containing the abrasive material which is then sucked from ~~it the tank~~ and projected onto the object to be cleaned.

[0006] Some sandblasting procedures include the use of water in addition to ~~the~~ air and the granular abrasive material ~~in granules~~, for a more efficient elimination of the particles to be removed. The operator directs the nozzle towards the object to be cleaned, thus projecting the granular abrasive material ~~in granules~~ onto the surfaces of the object to be cleaned.

[0007] The ~~current~~ sandblasters in the prior art also comprise a sandblasting booth, a vacuum suction system for the granular abrasive material, ~~in granules~~ and a filtering system for the air leaving the booth.

[0008] The booth consists basically of a ~~shell~~ hollow structure provided with an access door, a glass inspection window, two holes with long-sleeved gloves, and an outlet at the bottom. The sandblasting booth is designed to accommodate the object to be cleaned and is provided with a hopper base for the outflow of the air and solid parts (particles removed and sand or granular abrasive material ~~in granules~~).

[0009] The ~~inside~~ inner portion of the booth contains the nozzle for the emission of the air and the sand or granular abrasive material ~~in granules~~.

[0010] The front wall of the sandblasting booth is provided with a glass window for checking the sandblasting process and with two gloves with sleeves, extending inside the sandblasting booth and accessible from the outside, to allow the operator to ~~manoeuvre~~ handle the sandblasting nozzle and rotate the object to be cleaned.

[0011] The feed system for the granular abrasive material ~~in granules~~ is installed separately from the sandblasting booth and comprises upstream a ~~pressurised~~ pressurized air source and downstream at least one sandblasting nozzle housed in the sandblasting booth.

[0012] The sandblasting booth discharge hopper is connected to the suction and separation system for the fumes leaving the booth, said system being designed in such a way as to separate the solid parts (particles removed and abrasive material) from the air.

[0013] The ~~current~~ sandblasters in the prior art have a number of disadvantages.

[0014] ~~First, the~~ The sandblasting booths of the ~~current~~ sandblasters in the prior art are made of bent and welded sheet metal or ~~fibre~~ glass ~~fiberglass~~.

[0015] The closed booths made of sheet metal are very noisy, as the air emitted under pressure from the sandblasting nozzle generates sound waves which are amplified by the metal walls of the sandblasting booth[[:]]. Further, the sand or granular abrasive material ~~in granules~~ projected onto the object to be cleaned and the metal walls of the sandblasting booth generate noise, causing the vibration of the metal walls of the sandblasting booth.

[0016] The various walls and metal and sheet ~~and~~ metal parts are joined by welding, and the welding spots, which generally correspond to the bending corners, can be naturally porous due to ~~welding with~~ the addition of filler metal during the welding process. This problem is amplified ~~by is also due to~~ the fact that in sheet metal welding it is not possible to add significant quantities of filler metal.

[0017] Furthermore, the gaskets employed in the prior art are subject to involuntary treatment with the abrasive jet, with a consequent rapid deterioration. After a short time the booth is no longer sealed, with consequent loss of abrasive material, which is harmful for the users. This porosity or microporosity causes also a loss of material, or water in the versions with water, which can occur even after ~~some~~ a relatively short time of use. If the ~~system~~ construction material employed is not stainless steel, the problem could be further accelerated due to the corrosion that occurs as a result of oxidation of the above porosity points.

[0018] If aggressive chemical agents are used in the sandblasting process, for example degreasers or solvents, the metal walls and the ~~welds~~ welding lines are affected by the action of said chemical agents, which can trigger metal corrosion or oxidation.

[0019] Closed metal booths also require skilled ~~labour~~ labor for the welding of the various internal and external supports for ~~fixing~~ connecting the various parts to the structure, such as the hinges for the loading door, the brackets for the door locks, the supports for the delivery means, etc.

[0020] The objects placed inside the closed booths and turned on their various sides for cleaning ~~are~~ may also be inadvertently pushed against the metal walls, which can be surface damaged, deformed or seriously damaged.

[0021] ~~Further, closed~~ Closed booths made of metal are very heavy due to the construction material used, with consequent problems of ~~transport~~ transportation, installation and subsequent handling.

[0022] Closed booths made of ~~fibre glass~~ fiberglass partly dampen the noise and can absorb occasional shocks, but are also affected by the abrasive action of the sand or abrasive material in granules, consequently wearing out and producing and accumulating glass dust in the hopper, in the outlet and in the filtering system.

[0023] In addition to the above problems strictly relating to closed booths, there are other disadvantages concerning the entire sandblasting system.

[0024] The various parts of the current sandblasters (sandblasting booth, suction system for sand or granular abrasive material ~~in granules~~ and filtering system) constitute independent elements interconnected by ducts, pipes and cables. All ~~said these~~ separate parts require space for installation and maintenance; furthermore the various pipes, ducts and cables hinder the transit and work of the operator.

[0025] If the operator ~~has~~ is required to modify the sandblaster operating parameters, for example, pressure, quantity of sand or granular abrasive material ~~in granules~~, or amount of

water or other liquids, he ~~is obliged to~~must interrupt the sandblasting operation, in order to access the suction system and make the necessary modifications.

~~DISCLOSURE OF THE INVENTION~~BRIEF SUMMARY OF THE INVENTION

[0026] ~~The~~One aim of ~~this the present~~ invention is to ~~produce~~provide a cleaning plant with a ~~sandblasting~~blasting booth that can optimally ~~withstands~~withstand shocks and wear.

[0027] A further aim of ~~this the present~~ invention is to produce a cleaning plant with ~~sandblasting~~blasting booth walls whose structure and ~~material~~materials are suitable for soundproofing the inside from the outside of the ~~sandblasting~~blasting booth.

[0028] A further aim of the present invention is to improve the operator's working conditions from the environmental point of view, reducing noise and polluting emissions.

[0029] A further aim of ~~this patent is to produce~~the present invention is to provide a cleaning plant resistant to chemical agents.

[0030] A further aim of ~~this patent is to produce~~the present invention is to provide a cleaning plant with ~~the~~ various parts combined in one single body, or in any case assembled as one single body.

[0031] A further aim of the present invention is to provide~~this patent is to produce~~ a cleaning plant using sodium bicarbonate, mixtures ~~of it~~thereof and/or similar means as cleaning material.

[0032] A further aim of the present invention is to provide~~this patent is to produce~~ a cleaning plant with controls for adjusting and mixing ~~pressurised~~pressurized air, for feeding abrasive or granular cleaning material ~~in granules~~, and for adding water or liquids, said controls being located beside the operator's position or in any case being easily and immediately accessible by the operator.

[0033] A further aim of the present invention is to provide~~of this patent is to produce~~ a prefabricated cleaning system requiring less ~~labour~~labor and less time for its manufacture and assembly.

[0034] A further aim of ~~this patent is to produce~~the present invention is to provide a cleaning plant weighing less than the plants ~~currently known~~in the prior art.

[0035] ~~This patent~~The present invention concerns a new cleaning plant with ~~sandblasting~~blasting booth consisting of single and/or box-type plastic walls.

[0036] ~~The subject of this patent is~~The present invention further concerns a new cleaning plant with ~~sandblasting blasting~~blasting booth ~~consisting of~~comprising one single continuous element, i.e. a single-block.

[0037] The present invention further concerns~~The subject of this patent is~~ a new cleaning plant using sodium bicarbonate, mixtures ~~of it~~thereof, or similar means as a cleaning material.

[0038] The present invention further concerns~~The subject of this patent is~~ a new cleaning plant with ~~the~~a device for feeding the granular abrasive material ~~in granules~~that is incorporated in the structure of the cleaning plant.

[0039] The present invention further concerns~~The subject of this patent is~~ a new cleaning plant with air and waste water filtering device incorporated in the structure of the cleaning plant.

SUMMARY DESCRIPTION OF DRAWINGSBRIEF DESCRIPTION OF THE SEVERAL VIEWS OF THE DRAWINGS

[0040] The attached drawings are intended to facilitate the description of the invention ~~illustrating a possible form of~~and illustrate one embodiment of the invention. Said drawings are not intended to restrict the nature of the inventive concept~~covered by this patent~~.

[0041] Figure 1 shows ~~an axonometric~~an exploded view of the various component parts, illustrated separately, ~~constituting the new~~of the abrasive cleaning plant ~~comprising which~~comprises at least one ~~sandblasting~~blasting booth (C), a base or support (S) for the ~~sandblasting~~blasting booth (C), a feeding device (A) for the abrasive material in granules and a filtering device (F).

[0042] Figure 2 shows ~~the front view of~~ a vertical cross section ~~intersecting the~~sandblasting booth (C) with the related support (S) and the feeding device (A) of the abrasive cleaning plant of Fig. 1.

[0043] Figure 3 shows ~~the front view of~~ another vertical cross section ~~intersecting the~~sandblasting booth (C) with the related support (S) and the filtering device (F) of the abrasive cleaning plant of Fig. 1.

[0044] Figure 4 shows an ~~axonometric exploded~~ view of the ~~version with single L-shaped elements~~ variant of the embodiment of Fig. 1.

DETAILED DESCRIPTION OF THE ~~PREFERRED EMBODIMENT OF THE~~ INVENTION

[0045] The detailed description of an embodiment of the invention is provided herein. It is to be understood, however, that the present invention may be embodied in various forms. Therefore, the specific details disclosed herein are not to be interpreted as limiting, but rather as a representative basis for teaching one skilled in the art how to employ the present invention in virtually any detailed system, structure, and manner.

[0046] Turning first to Fig. 1, there is shown a first embodiment of the invention comprising a~~The new cleaning plant comprises at least one sandblasting~~ booth (C), a support (S) for the ~~sandblasting~~ booth (C), a feeding device (A) for the abrasive or cleaning material in granules, and a filtering device (F).

[0047] The ~~sandblasting~~ booth (C) comprises walls (Cp) designed to enclose an area adequate to contain the objects to be cleaned, in addition to permitting their rotation and movement, so that cleaning can be performed on all the surfaces and sides of the ~~object~~ objects to be cleaned.

[0048] A wall (Co) of the ~~sandblasting~~ booth (C), preferably a vertical side wall, is hinged to the other walls (Cp) to form a door, thus permitting access to the inside of said ~~sandblasting~~ booth (C) to position or withdraw the objects to be cleaned.

[0049] The opening wall (Cp) and/or the edge of the ~~sandblasting~~ booth (C) in contact with said opening wall (Cp) are provided with gaskets designed to ensure a hermetic seal of said opening wall (Cp).

[0050] The fixed walls (Cp) and the opening wall (Co) of the ~~sandblasting~~ booth (C) ~~consist of~~ comprise one or two plastic sheets generically parallel and forming a basically closed and hollow ~~parallelepiped box~~. The plastic used to produce the walls (Cp, Co) of the ~~sandblasting~~ booth (C) is preferably polyethylene (PE), polyvinyl chloride (PVC), polypropylene (PP), ABS, ~~fibre~~ glass a reinforced plastic, other similar materials or mixtures, and derivatives of the same.

[0051] One of the walls (Cp) of the ~~sandblasting~~ booth (C), preferably the front ~~one wall~~ (Ca), features an inspection window (Cf) and two holes (Cm) positioned side by side. The inspection window (Cf) consists of an opening in the wall (Ca) provided with a

transparent material, such as a transparent glass, and is designed to allow the operator to observe the inside of the ~~sandblasting~~ blasting booth (C). The two holes positioned side by side (Cm) are provided with two long gloves made of a flexible plastic material and facing the inside-inner portion of the ~~sandblasting~~ blasting booth (C), ~~in such a way as to allow in~~ order to enable the operator to manipulate the ~~object~~ objects inside ~~said sandblasting~~ the ~~blasting~~ booth (C) without coming into direct contact with ~~the objects inside the sandblasting~~ such objects and at the same time preventing the outflow of air and suspended particles (sodium bicarbonate, salts in general, granules of abrasive material, and removed particles) that may be present inside the ~~sandblasting~~ blasting booth (C). A recess (C1) is provided at the top for a light fixture.

[0052] The lower wall of the ~~sandblasting~~ blasting booth (C), i.e. the bottom wall (Ct), is hopper-shaped in order to collect and convey all the free particles (granules of abrasive material[[,]] and removed particles) present inside the ~~sandblasting~~ blasting booth (C) towards an outlet duct (Ce). The delivery means with a nozzle (L) for the emission of ~~the an~~ an air jet and of the granular abrasive material ~~in granules is are connected to the feeding device (A)~~ and are also housed inside the ~~sandblasting~~ blasting booth (C). ~~This~~ These delivery means with nozzle (L) ~~is are~~ are connected to the feeding device (A) by means of a suitable hose (La).

[0053] The ~~sandblasting~~ blasting booth (C) constructed as described above is sustained by an adequate support (S), generally consisting of a ~~parallelepiped box-shaped~~ base, open at the top (Ss) to accommodate the hopper- shaped bottom (Cf) of the ~~sandblasting~~ blasting booth, and provided with an opening (Sf) on the side wall facing the filtering device (F) for the connection of the outlet pipe (Ce) of the ~~sandblasting~~ blasting booth (C) hopper (Cf) to the filtering device (F) and/or damp parts separator.

[0054] Turning now to Fig. 2, it can be seen that ~~the~~ The feeding device (A) comprises a shell structure (Al), whose ~~height-size~~ height-size and profile are such as to be laterally coupled with the ~~sandblasting~~ blasting booth (C), ~~housing and houses inside~~ at least one tank (As) for the granular abrasive material ~~in granules~~ and a device for sucking the granular abrasive material ~~in granules~~ from the tank (As) and mixing it with compressed air and/or water.

[0055] The feeding device (A) is provided on its upper front wall with the controls and instruments (Ac) for controlling the operation of the feeding device (A) itself.

[0056] During operation, the ~~The~~ feeding device (A)[[,]] is connected to a ~~pressurised~~ pressurized air line and a ~~pressurised~~ pressurized water line, and sucks-operates by sucking the abrasive material from the tank (As) and ~~conveys-conveying~~ conveys it via the hose (La) to the delivery means with nozzle (L) housed in the ~~sandblasting~~ blasting booth (C).

[0057] Alternatively, a tank containing the pressurized abrasive material can be provided, from which the material flows out at an adjustable speed.

[0058] The feeding device (A) is such as dimensioned to be laterally coupled with the ~~sandblasting~~blasting booth (C), so that the controls and instruments (Ac) for controlling said feeding device (A) are beside the inspection window (Cf) and the two holes (Cm) in the ~~sandblasting~~blasting booth (C).

[0059] Turning now to Fig. 3, there is shown theThe filtering device (F), which comprises a shell structure (Fi) whose ~~height~~size and profile are such as to be ~~laterally~~ coupled with the ~~sandblasting~~blasting booth (C) on one side, and to be coupled at the rear with the feeding device (A), inside which there ~~is~~are a suction device (Fa) and a cartridge filter(s) (Fc) provided with a cleaning duct (Fk).

[0060] Further, theThe filtering device (F), ~~in particular, is such as is dimensioned~~ to be coupled with the support (S) of the ~~sandblasting~~blasting booth (C) and with the side opening (Sf) of the support (S)~~itself~~.

[0061] The shell structure (Fi) of the filtering device (F) is provided at ~~the one~~one side with a hole or opening (Ff) suitable for being coupled with said support (S), so that the outlet pipe (Ce) of the ~~sandblasting~~blasting booth (C) hopper (Ct) runs into the filtering device (F).

[0062] The ~~sandblasting~~blasting booth (C) with the support (S), the feeding device (A) and the filtering device (F) are ~~such as~~designed to couple and connect reciprocally, forming one single element which can be split into its various parts for ~~transport~~transportation, movement and handling.

[0063] The new cleaning plant with single-block plastic booth and integrated feeding and filtering devices constructed as described above offers numerous advantages.

[0064] ~~The new cleaning plant~~ above described embodiment has very compact dimensions, since it ~~incorporates in one single area~~ the ~~sandblasting~~blasting booth (C), the feeding device (A), the filtering device (F) 20 and the dust and/or waste water outlet separator are integrated within a single area without affecting functionality.

[0065] The construction material and shape of the walls (Cp) of the ~~sandblasting~~blasting booth (C) do not produce the soundbox effect normally generated in ~~traditional~~ ~~sandblasting~~blasting booths in the prior art, in its turn reducing the overall noise level of the plant.

[0066] The plastic material used is not porous and is not subject to corrosion or oxidation. ~~As~~ Because the ~~sandblasting~~blasting booth (C) is built in one single element, there are no joints with possibility of breakage and outflow of material.

[0067] ~~As~~Because the ~~sandblasting~~sandblasting booth (C), and also the support (S) and the shell structures (Al, Fi) of the feeding device (A) and/or filtering device (F), can be produced in one single plastic body, manual operations and ~~work-labor~~ for the assembly and fixing of the various parts are considerably reduced.

[0068] ~~The plastic moulding process permits~~The molding manufacturing process of the plastic material provides greater precision in the repeatability of the pieces than in the prior art, avoiding the risk of human error.

[0069] All ~~this of the above features~~, therefore, ~~reduces~~provide for reduced assembly times and consequently overall production costs.

[0070] The use of plastic material for the production of various parts of the new cleaning plant ~~will limit~~also limits the weight of the plant as a whole, with consequent advantages for ~~transport-transportation~~ and the possibility of ~~being removed and shifted~~removing and relocating the plant at any time with no need to use special equipment. The use of plastic material for the production of various parts of the ~~new-cleaning plant~~ in the present embodiment, and in particular ~~of for the sandblasting~~booth (C), ~~increases the~~ provides for increased resistance of the various parts and in particular of the ~~sandblasting~~sandblasting booth (C) itself to shocks.

[0071] ~~Further, The new-the~~ cleaning plant according to the present embodiment is not subject to corrosion and/or oxidation ~~of caused by~~ any chemical substances used in the cleaning process, as the ~~sandblasting~~sandblasting booth (C) and the various ~~pipes~~conduits, if made of plastic, do not ~~oxidise-oxide but instead~~and they withstand corrosion.

[0072] As shown in Fig. 4, ~~It is expedient for~~ the base (S) and the shell structures (Pi) and (Al) ~~to may~~ be made in one single element provided with side and/or upper openings for fitting the above described pieces of equipment ~~described~~.

[0073] Therefore, with reference to the above description and the attached drawing, the following claims are put forth.

ABSTRACT

[0074] ~~The invention is a new cleaning plant using sodium bicarbonate, its mixtures or similar means, provided with a single block plastic sandblasting booth (C). The booth is positioned on a single block plastic L-shaped element comprising a support (S), a chamber for the cleaning material feeding device (A) and a chamber for the filtering device (F). The sandblasting booth (C) has the bottom (Ct) shaped like a hopper, a hinged opening side wall (Co) designed to permit access, an inspection window (Cf) provided with transparent glass, and two holes (Cm) positioned side by side for the insertion of long gloves.~~ An abrasive cleaning plant comprising a single-block plastic blasting booth (C) having a front wall, a rear wall, a top wall, a bottom wall, and side walls, wherein at least a portion of one of the side walls is openable by rotation on a hinge connecting the single-block blasting booth with the openable side wall portion, thereby providing access inside the single-block blasting booth, and wherein one or more gaskets create a hermetic seal between the single-block blasting booth and the openable side wall portion, the one or more gaskets being provided on one or more of the single-block blasting booth and of the openable side wall portion. The abrasive cleaning material may comprise sodium bicarbonate or a mixture thereof.